12MHz Zero-Wait 80286 Turbo Main Board

MB -1212C

User's Manual

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Preface

This User's Manual explains how to install and expand your personal computer based on the C&T high performance "Baby AT" Turbo Mainboard. By reading this manual, you will be able to set up your system and prepare to operate it.

The C&T Turbo Mainboard may run different operating systems, and corresponding large number of application programs. In most circumstances, you will probably be using MS-DOS or PC-DOS, the disk operating system supported by a large and growing library of IBM PC compatible application programs. This manual, however, discusses software only in relation to setting up and testing your computer hardware. Refer to the other manuals that accompany your system and applications software for necessary information.

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About This Manual

This manual is divided into four chapters.

Chapter 1 provides an introduction and overview of the system and orients you to the various components discussed in the remainder of the manual. In addition you will find specifications in Chapter 1.

Chapter 2 explains how to install the mainboard into the system unit. In many cases, this will have already be done for you by your dealer; however, it's a good idea to familiarize yourself for future reference. The more you know about the workings of your computer, the more likely you will be satisfied with its performance and features.

Chapter 3 explains the procedures for first time startup, including turning on the power and setting system defaults, and explains how to use EMS 4.0.

Chapter 4 explains the procedures for AMI BIOS Setup.

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Introduction

The 80286 C&T Turbo Mainboard is a high performance AT-compatible mainboard that provides high-speed processing while maintaining full compatibility with the IBM PC/AT. The mainboard is designed to be mounted in a standard PC/XT, "baby AT", or AT-type chassis and uses industry standard power supply inputs, connectors, expansion board sockets, etc.

A minimum computer system includes.

- 80286 C&T Turbo Mainboard.
- IBM AT power supply or equivalent.
- IBM AT keyboard or compatible.
- Hard disk/floppy disk controller card.
- At least one floppy disk drive (360KB/720KB/1.2MB/1.44MB).
- An IBM AT CGA, MDA, EGA, VGA display card or compatible.
- A monitor that is compatible with the display card.

Your system also may have additional diskette drives, hard disk drives, interface boards, modems, printer adapter, tape backup units, etc. In fact, any device designed for IBM PC/AT and compatible systems can be installed or connected to the mainboard.

1.1 80286 C&T Turbo Mainboard

As in most IBM PC/AT compatible systems, the C&T mainboard mounts in the bottom of the system unit. Using standard connectors and mounting holes, it connects to the system unit's power supply connector and mounting posts.

1.2 Compatibility

The C&T mainboard will run all PC programs on the market. The primary component that determines compatibility is the basic input/output system (BIOS). This is a program that resides in read-only memory (ROM) chips on the mainboard.

1.3 Performance

The next most important consideration of most PC users (after compatibility) is speed. The C&T mainboard employs a 80286 microprocessor, with a selectable speed of 12MHz and 6MHz. Speed is selectable via software command, keyboard, and hardware switch.

1.4 Memory

Memory expansion is another primary consideration when configuring a computer system. The C&T mainboard provides socket for up to 4MB of dynamic random access memory (DRAM).

1.5 Expandability

Other consideration for many users include the number of expansion slots and the type of disk drive support. The C&T mainboard provides five 16-bit and two 8-bit I/O connectors. Extensive support is built into the setup ROMs, including all the popular hard disks, as well as 3.5" diskette drives (both 720KB

and 1.44MB). Of course, the standard 360KB and 1.2MB diskette drives are fully supported.

1.6 Specification

Processor and System

Processor type:	Intel or AMD 80286 rated at 12MHz.
System Speed:	12MHz and 6MHz software and hardware selectable.
Coprocessor:	8MHz 80287 (optional)
Memory Capacity:	Up to 4MB
Memory configuration:	Versatile memory combination: 512K/640K/1024K memory using 41256, 44256, 4464, 4164 chips 512K/1024K/2048K/4096K memory using 256K/1M SIMP MODULE

BIOS Subsystem

Type:	C&T SCAT BIOS
ROM capacity:	EPROM BIOS space for custom BIOS applications.
Additional BIOS features:	Setup program resides in ROM. Power-on-self-test (POST) resides in ROM. User selectable bootup system speed stored in ROM.

I/O Subsystem

No. of slots:	Five 16-bit slots. Two 8-bit slots.
Form factor:	Standard slot spacing and mounting holes for full size XT chassis, "baby AT" chassis and full-size AT chassis.

Additional Features

Miscellaneous connectors:	Reset button. Turbo speed indicator. External battery.

1.7 Connectors and Jumpers

Jumper No.	Function
PS1/PS2	Power supply connector
KB1	Keyboard connector
J1	Keylock/Power LED
J2	Speaker connector
JP1	Turbo LED connector
JP2	Hardware reset switch
JP3	Turbo hardware switch
JP4	Coprocessor CLK select
JP6	Color/monochrome monitor select
JP7	Power good select
BAT1	External Battery connector

1.8 Feature of MB-1212C SCAT Main Board

* 12MHz Zero-Wait 80286 Turbo Main Board
* 12MHz 0-Wait-State operation (15.5MHz by LANDMARK V2.0)
* Chip set by C&T single chip (SMT for better performance and contact)
* Friendly BIOS setup
* Parity Check Enable/Disable selectable via software
* Socket for optional 80287 math coprocessor
* Supports EMS 4.0 Hardware
* Supports up to 4M Byte on Board memory
* DRAM type supports 4164, 4464, 41256, 44256 (DIP TYPE)
* DRAM type supports 256K/1MSIMP MODULE
* 80ns DRAM required.
* Support five 16-bit slots, two 8-bit slots
* On board Power-Good signal provided.
* Dimension: 9.6'' x 8.6''
* Support MS/DOS, UNIX/XENIX, NOVELL, OS/2...

Mainboard Installation

This chapter explains how to install you C&T mainboard. These procedures may already have been performed by your dealer. If so, you may skip to Chapter 3.

In this manual when referring to jumpers the word "closed" means to mount a shorting plug on the corresponding pins of the jumpers.

This chapter is divided into the following sections:

- Adding memory
- Adding a Coprocessor
- Mounting
- Connecting internal cables

2.1 Adding Memory

If your C&T mainboard does not have RAM memory, you must install memory chips for it to work.

64Kbits (4464 and 4164), 256Kbits (44256 and 41256), and 256KB/1MB Module can all be installed in your system.

2.1.1 Memory Combination

Table 2.1.1 Using 44256/41256/4464/4164 Memory Chips Combination

Memory size	Bank O/Socket NO.	Bank 1/Socket No.
	DIP TYPE DRAM	DIP TYPE DRAM
512KB	44256-8 x 4 PCS (UP9, 10, 16, 17) 41256-8 x 2 PCS (U3, 4)	--- ---
640KB	44256-8 x 4 PCS (U9, 10, 16, 17) 41256-8 X 2 PCS (U3, 4)	4464-8 x 4 PCS (U7, 8, 14, 15) 4164-8 X 2 PCS (U1, 2)
1024KB	44256-8 x 4 PCS (U9, 10, 16, 17) 41256-8 x 2 PCS (U3, 4)	44256-8 x 4 PCS (U7, 8, 14, 15) 41256-8 x 2 PCS (U1, 2)
DRAM SPEED: 80ns		

Table 2.1.3 Using Module DRAM (SIMP)

	Module type DRAM	Module type DRAM
512KB	256K-8 MODULE x 2 PCS (U25, 26)	---
1024KB	256K-8 MODULE x 2 PCS (U25, 26)	256K-8 MODULE x 2 PCS (U23, 24)
2048K	1M-8 MODULE x 2 PCS (U25, 26)	---
4096K	1M-8 MODULE x 2 PCS (U25, U26)	1M-8 MODLUE x 2 PCS (U23, 24)
DRAM SPEED: 80NS		

2.2 Installing an 80287 Coprocessor

If you use certain graphic or programming applications, you may want to install a math coprocessor to enhance the performance of your system. Note, however, that your application program must be specifically designed to take advantage of the math coprocessor to benefit from its presence in the system.

To install and configure the math coprocessor:

1. Obtain a math coprocessor that corresponds to your CPU speed. If you have a 12MHz system, use a 8MHz or 10MHz 80287.
2. Locate the empty socket next to the BIOS.
3. Carefully insert the coprocessor making sure that the notch of the chip is aligned with the notch of the socket connector on the mainboard.

If your 80287 comes with protector, it may be assembled by folding it into a loop. Then insert the coprocessor into the safety protector making sure that the notch in the safety protector is on the same end as the notch as in the coprocessor.

The coprocessor is static sensitive. Reduce static by touching the system frame with one hand while installing the coprocessor in your system unit.

2.3 Setting the Monitor Type

Set the monitor type to match your monitor. If you have a color monitor (CGA, EGA, etc), set the monitor type to color. If you have a monochrome monitor (IBM monochrome adapter, Hercules, etc), set the monitor type to monochrome. To set the monitor type, set jumper JP6 as follows:

JP6: Monitor Select

JP6: (1,2) Closed to select monochrome monitor

JP6: (2, 3) Closed to select color monitor

2.4 Mounting the Mainboard

To mount the mainboard in the system unit, follow these steps:

1. Carefully place the mainboard into the system unit chassis, RAM sockets toward the front left corner.
2. Position the mainboard over the chassis mounting standoffs. Align the appropriate mounting holes. Note that the board has holes for more than one type of chassis, so some holes will not be used.
3. Mount the mainboard using the screws removed from the old mainboard, or using the screws provided with the system unit chassis.

2.5 Internal Connection

Now that the mainboard is securely fastened into the system unit chassis, the next step is to connect the power cables and other wires.

1. Connect the power supply cable to the mainboard. This connector will fit correctly only one way. Do not force it, but make sure it is fully seated.
2. Connect your system's keylock switch and power indicator LED to the KEYLOCK/POWER (J1) connector.
3. If your system has a front panel reset button, connect its leads to the RESET (JP2) connector.
4. Connect your system's speaker leads to the SPEAKER (J2) connector.
5. If your system has a front panel speed selector switch, connect it to the TURBO hardware (JP3) connector.
6. If your system has a front panel speed indicator LED, connect its leads to the TURBO LED (JP1) connector.

The pinouts of the mainboard jumpers and connectors can be found in Table 2.5 below.

Table 2.5

Connector	Function	Jumper setting
PS1/PS2	Power supply connector	
KB1	Keyboard connector	
J1	PWR & Keyboard LED connector	(1–3): Power LED (4,5): Keylock
J2	Speaker connector	1: +5Vdc 2: Not used 3: Not used 4: Ground
JP1	Turbo LED connector	
JP2	Reset suitch connector	
JP3	Turbo switch connector	
JP4	Coprocessor CLK select	(1,2) closed: Processor CLK (2,3) closed: External CLK
JP6	MGA/CGA/EGA/VGA monitor select	(2,3) closed: CGA/EGA/VGA (1,2) closed: MGA
JP7	Power good select	(2,3) closed: internal (1,2) closed: external

First Time Startup

The first time you start your system, you will need to follow some special procedures to specify your system configuration, initialize and format your hard disk, and install system software. This chapter explains these special procedures. Do not proceed until you are certain your system has been properly installed and connected to an appropriate power source.

In this chapter, you will:

- Turn on system power.
- Run the setup program to specify various system configuration parameters.

3.1 Turning on the Power

Turn on system power by first turning on the video display power switch, then turning on the power switch. The system will go through its automatic power on self test (POST) and then attempt to boot (that is, to load the operating system from a disk drive).

Since your disks are not formatted, and since the system does not yet know what type of disks your system has, you will get an error message when POST completes. This error message is normal during this phase.

3.2 C & T BIOS SETUP

The SCAT BIOS is an IBM AT compatible BIOS containing enhancements to the standard AT BIOS. This BIOS resident code permits the user to set machine attributes such as date, time memory sizes, the number and type of diskette and hard drives, and display adapter used.

When you the first time start your system, you must setup to specify your system configuration. First of all we press and hold down <Ctrl> and <Alt> keys while simultaneously pressing "S" key. The following message will appear on your screen: (Table 3.2)

This menu is divided into four boxes. The top box shows the title of this menu, i.e. Standard Setup Options. The second box contains all the modifiable data fields. The current field is highlighted. The third box shows a help line. A unique prompt is displayed here for each of the fields that can be selected in the second box.

The bottom box lists the keys that can be typed. The <Up Arrow>, <Down Arrow>, <Left Arrow>, and <Right Arrow> keys are used to move from the current field to the next or previous. The <Plus> and <Minus> keys in the numeric keypad are used to increment or decrement the current field. The <Esc> key is used to exit Embedded Setup without saving changes. The <F10> function key is used to save changes and then exit. The <PgDn> key is used to switch to the Advanced Feature Control menu.

Configuring the time and date

The time and date can only be set in the Standard Setup Options menu, even though they are displayed in the Advanced Feature Control menu as well. The time and date are updated once per second while the setup menu is being displayed, unless one of the hour, minute, or second fields is currently selected, in which case the time is frozen. When a non-time field is selected, then the real time clock will be set to the displayed value and start keeping

time from there. The month, day, and year fields work the same way. The maximum value for day depends on the month and year. The maximum value for year is 2099.

Chips and Technologies, Inc. System Configuration Utility

STANDARD SETUP OPTIONS

Time:	00:25:45						
Date:	Jan 01, 1989						
Diskette A:	3.5 Inch, 1.44 MB						
Diskette B:	Not Installed						
		Cyl	Hd	Pre	LZ	Sec	Size
Fixed Disk C:	Type 2	615	4	300	615	17	20
Fixed Disk D:	Not Installed						
Base Memory:	640 KB	BIOS Found:					
Extended Memory:	1024 KB	.640 KB					
Display:	EGA or VGA	1024 KB					

Select the type of the first diskette drive (Drive A)

↑↓←→ to select entries — PgDn for Advanced Feature Control
+– to change an entry
ESC to exit without saving — F10 to save then exit

Configuring the Diskette Drive(s)

Possible floppy diskette types are:

Not Installed
5.25 Inch, 360 KB
5.25 Inch, 1.2 MB
3.5 Inch, 720 KB
3.5 Inch, 1.44 MB

Be sure to enter the type of the diskette drive, and not the type of floppy media being used.

Configuring the Fixed Disk(s)

Default fixed disk types defined in the standard BIOS are: (Table 3.3)

Cyl – Cylinders per drive
Hd – Heads per drive
Pre – Pre-Comp (-1 means NONE)
LZ – Landing Zone
Sec – Number of Sectors per Cylinder
Size – Total storage size in MEGS.

Table 3.3

Type	Cyl	Hd	Pre	LZ	Sec	Size
1	306	4	128	305	17 17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	940	6	512	940	17	46
6	615	4	−1	615	17	20
7	462	8	256	511	17	30
8	733	5	−1	733	17	30
9	900	15	−1	901	17	112
10	820	3	−1	820	17	20
11	855	5	−1	855	17	35
12	855	7	−1	855	17	49
13	306	8	128	319	17	20
14	733	7	−1	733	17	42
15		--- Invalid ---				
16	612	4	0	663	17	20
17	977	5	300	977	17	40
18	977	7	−1	977	17	56
19	1024	7	512	1023	17	59
20	733	5	300	732	17	30
21	733	7	300	732	17	42

Continue on next page

Table 3.3

Type	Cyl	Hd	Pre	LZ	Sec	Size
22	733	5	300	733	17	30
23	306	4	0	336	17	10
24	612	4	305	663	17	20
25	612	2	300	612	17	10
26	614	4	−1	614	17	20
27	820	6	−1	820	17	40
28	977	5	−1	977	17	40
29	1023	9	−1	1023	17	70
30	1024	5	−1	1024	17	42
31	1024	8	−1	1024	17	68
32	809	6	128	809	17	40
33	830	7	−1	830	17	48
34	830	10	−1	830	17	68
35	1024	5	−1	1024	17	42
36	1024	8	−1	1024	17	68
37	615	8	128	615	17	40
38	615	8	−1	615	17	40
39	925	9	−1	925	17	69
40	1024	9	−1	1023	17	76
41-47	--- Empty ---					
48-49	USER TYPE (USER CAN DEFINE FIXED DISK)					

Setting Base Memory Size

Possible Base Memory options are:

512 KB
640 KB

depending on the machine configuration. Select the proper value for your machine.

Setting Extended Memory Size

To configure the amount of extended memory, all of which is located above 1 Megabyte in the CPU address space, select the value. This memory is typically used by RAM disks, disk caching programs, and operating systems like UNIX and OS/2. The values for this option must be entered in multiples of 64 KB.

Selecting the Primary Display Adapter

Setting the Primary Adapter tells the BIOS which video adapter will be the main one for the machine.

Possible values for display adapters are:

Color (40 x 25)
Color (80 x 25)
Monochrome
EGA or VGA

Advance Feature Control Options

The second Embedded Setup menu is accessed by pressing the <PgDn> key. These are the AT extended features that are not available in an IBM PC AT.

Chips and Technologies, Inc. System Configuration Utility ADVANCED FEATURE CONTROL	
Time:	00:28:05
Date:	Jan 01, 1989
MumLock:	On
CPU Speed:	Fast
RAM Wait States:	0
Shadow System BIOS:	Disabled
Shadow Video BIOS:	Disabled
640K-1024K Relocation:	Disabled
EMS Memory:	Disabled
EMS Memory Size:	0.5MB
EMS Base Memory Address:	D0000h
EMS Base I/O Address:	208h/209h
Select the state of the MumLock at start-up	
↑↓←→ to select entries +— to change an entry ESC to exit without saving	PgUp for Standard Setup Options F10 to save then exit

Each field, when selected, will have an appropriate prompt displayed in the third box from the top. The <PgDn> key is not available in this menu. Instead, the <PgUp> key is used to go back to the Standard Setup Options menu.

Setting Numlock on Boot

Configuring this option will either turn the numlock On or Off after booting the machine.

Making a Speed Selection

If your machine supports two speeds, this option is used to select either high or low speed as the default. In most cases, you will want to operate in high speed. The default can be changed to either Fast or Slow.

Once the machine is booted, it is also possible to switch speeds using the <Ctrl-Alt-Plus> sequence for high speed and the <Ctrl-Alt-Minus> sequence for low speed.

Selecting the Number of RAM Wait States

Wait states allow slow DRAM memory devices to operate in fast machines. Contact your dealer to determine the number of wait states required for reliable operation of your specific machine. Once the number of wait states has been set, it should not have to be changed unless you are adding or replacing memory with a different speed rating than the devices already in your machine. Note that mixing RAM memory devices of different speeds may cause problems.

Wait states can be set to either 0 or 1.

Shadowing the System or Video BIOS

If your machine has at least 1 Megabyte of RAM, you can configure some of it to hold the system BIOS and/or video BIOS, if your system has an EGA or VGA display adapter. The system BIOS normally resides in Read Only Memory (ROM) within the hexadecimal address range F0000-FFFFF. The video BIOS also normally resides in ROM within the hexadecimal address range C0000-CFFFF. Locating a BIOS in RAM can speed up the operation of a machine because RAM can generally be accessed more rapidly then ROM.

The System and Video BIOS can be shadowed separately. Either can be Enabled or Disabled.

Memory Relocation

If the system has exactly 1024 KB (1 MB) of memory, and the user does not wish to use the Shadow RAM feature, then that region (640KB-1MB) can be remapped so that it appears to the CPU to be 384 KB of extended memory starting at the 1 MB boundary.

Setting EMS Memory options

If you have more then 1MB of RAM on the system board, Setup can allocated a part of this memory as EMS memory. To enable EMS memory on the system board, first set the EMS Memory option to Enabled. If EMS Memory is Disabled, then all other EMS options are ignored.

Once the amount of memory is set, the EMS Base Memory Address and Base I/O Address can be modified: The EMS Base Memory Address is used to tell the BIOS where to access the 16KB EMS Pages. If there is another device that accesses the memory range specified by the default value, then the value should be modified. The Base I/O Address is used to tell the BIOS what I/O ports to use to access the EMS registers. If the default value specifies ports that conflict with another device, then the value should be modified.

The possible values for Base Memory Address are:

C0000h	= C0000h-CFFFFh memory range
C400h	= C4000h-D3FFFh memory range
C8000h	= C8000h-D7FFFh memory range
CC000h	= CC000h-DBFFFh memory range
D0000h	= D0000h-DFFFFh memory range
D4000h	= D4000h-E3FFFh memory range
D8000h	= D8000h-E7FFFh memory range
DC000h	= DC000h-EBFFFh memory range
E0000h	= E0000h-EFFFFh memory range

The possible values for Base I/O Address are:

208h/209h
218h/219h

When the user exits the Embedded Setup program, either by pressing the <Esc> key or the <F10> key, the system will reboot if running from post. If running the DOSETUP program from DOS, exiting will return the user back to DOS. However, if changes are made to the configuration, the user will be asked if the system should be rebooted.

3.2.1 Technical Option Control

CHIPS AND TECHNOLOGIES, INC SYSTEM
CONFIGURATION UTILITY TECHNICAL OPTION CONTROL

DMA CLK Source Select	; CPU × 1/4 (default)
Bus CLK Source Select	: PROCCLK/4
Refresh CMD Width	: 280ns (default)
CPU CLK Select (PROCCLK)	: CPU × 1 (default)
Parity Control	: Disable (default)
Dynamic Memory Sizing	; Enabled
DRAm Configuration	: 1MB (4 × 256K)W/384K EXT.
Base RAM Above 256K	: Enabled
Exted. Memory Boundary	: 1MB

Select the source for the DMA Clock

↑ ↓ ← → to select entries PgUp/PgDn to change menu
+ − to change an entry F5 to restore CHIP set defaults
ESC to exit without saving F10 to save then exit

***DMA CLK Source Select**

Users utilize + – keys to select the source for the DMA Clock. DMA CLK is default-Set at CPUx1/4

***Bus CLK Source Select**

Users utilize + – keys to select the sourc for the AT BUS CLock.

***Refresh CMD Width**

Users utilize + – keys to select the width (in nanoseconds) of the RAM Refresh Command. Refresh CMD Width is default-Set at 280ns.

***CPU CLK Select (PROCCLK)**

Users utilize + – keys to select the source frequency of the CPU Clock for normal operation. CPU CLK is default-Set at CPUx1.

Parity control

Users utilize + – keys to select whether RAM parity checking should be done.

Parity check control is default-set at Disable. and the DRAM on socket U1/U2/U3/U4 are not used necessarily. If use SIMP Module DRAM, user can set parity check at Enable status. When use DIP DRAM, user can set Parity check at Eanble, and ORAM on socket U1/U2/U3/U4 are used necessarily.

***Dynamic Memory Sizing**

Users utilize + – keys to select whether the DRAM configuration shuld dynamically determined.

***DRAM configuration**

Users utilize + – keys to select the proper DRAM configuration for this system.

***Base RAM Above 256K**

Users utilize + – keys to select whether the systemboard base RAM above 256K should be recognized.

***EXTD. Memory Boundary**

Users utilize + – keys to select the address where Extended Memory should end and EMS begin.

3.3 Main board Speed Select

The next most important consideration of most PC users (after compatibility) is speed. The motherboard provided a 12MHz microprocessor, with a selectable speed of 12MHz and 6MHz. Speed is selected via hardware switch and keyboard.

Method/speed	12MHZ	6MHZ
Hardware switch (Turbo switch)	OPEN	SHORT
Keyboard	<Ctrl><Alt><+>	<Ctrl><Alt><–>

3.4 EMS 4.0 Hardware

The 82C235 chip supported EMS 4.0 hardware function. We gave user a device drive to drive EMS function.

If you want to use EMS 4.0 function, you must resetup one time. When your system memory size is 1MB, you only choose either shadow RAM or EMS. If you choose EMS, extended memory of the motherboard have to setup zero, EMS memory size setup 384KB and EMS memory and 640K–1024K relocation setup to enable. When your system memory size is above 1MB. EMS, shadow RAM and extended memory may exist at the same time. For example, if the memory size is 4MB and EMS is 2MB, then the base memory will be 640KB, 384KB of shadow RAM and 1MB of extended memory.

How do you use EMS 4.0 function? According to the method of the manual.

Procedure listed below:

If your system have a hard disk (drive C). The first you insert utility diskette into drive A. The second you copy the SCATEMM. SYS file driver from your utility diskette onto your bootable disk drive (drive C).

TYPE:
C> A: <Enter>
A> copy A: SCATEMM.SYS c: <Enter>
Adding the following line to your CONFIG.SYS file on your boot drive:

DEVICE = SCATEMM.SYS

*If your DOS have CONFIG.SYS file, you may used EDLIN command to add original data of CONFIG.SYS file.EDLIN command may avoid losing original data of CONFIG.SYS file.
*If your DOS have not CONFIG.SYS file, you must copy COMFIG.SYS file to DOS.

Type:

```
C >  COPY CON CONFIG.SYS                    <ENTER>
     DEVICE = SCATEMM.SYS                   <ENTER>
     PRESS <CTRL> "Z" OR "F6" KEY           <ENTER>
```

4.1 XCMOS Setup

The basic system parameters are commonly referred to as the "Setup." These parameters include the date and time, disk drive information, memory size, video display type and math coprocessor information. Instructions for setting the basic system parameters are explained below.

1. After you have completed all necessary hardware modifications, turn on the system. The Power On Self Test will execute immediately. If a configuration error is found, proceed to step 2. If no Setup error is found, you must manually invoke the setup program when prompted on the screen.
2. If a Setup configuration error is found the system will require you to run the Setup utility before proceeding.
3. When the Setup Utility is activated, the following choices will appear on the screen.

   EXIT FOR BOOT

   RUN CMOS SETUP

   RUN XCMOS SETUP

   Use the up and down arrow keys to choose "RUN XCMOS SETUP".
4. Verify that all the parameters are set correctly. If you have modified the system, make all the necessary changes.
5. After entering the new Setup information, exit the Setup Utility.

WARING – Improper use of setup may cause the system to fail operations.

If the system faics, press and hold the <INS> key and turn the machine off and then on.

Release the <INS> key after memory test starts
Hit <ESC> to stop now
Hit <ENTER> to continue

The main board BIOS offers the XCMOS feature and CMOS feature, but you must first setup XCMOS on this mainboard.This utility allows the user to customize the advanced features built into the system board. This setup utility is menu driven, making it easy to follow and use.

The features which can be set include:

CPU clock speed
Memory wait state

To access the XCMOS feature, use the up and down arrow keys to highlight the "RUN XCMOS Setup" When the setup utility is first activated. The following setup program will appear on the screen:

SCAT CHIPSET SETUP PROGRAM **MAIN MENU**
EASY SETUP SCAT CHIPSET WRITE CMOS REGISTERS AND EXIT DO NOT WRITE CMOS REGISTERS AND EXIT

* If you want to remain default value, you can choose "WRITE CMOS REGISTERS AND EXIT" directly.

Use the up and down arrows to select "EASY SETUP OPTION CHIPSET". The following screen will appear:

SCAT CHIPSET SETUP PROGRAM MAIN MENU
RETURN TO MAIN MENU CLOCK SELECTION WAIT STATE SETTING
↓ ↑ — CHANGE SELECTION ESC — RETURN TO MAIN MENU TO CHANGE RETURN — MAKE SELECTION

If you wish to change the system's operating speed, Choose SCAT CLOCK SELECTION. The following screen will appear:

CLOCK SELECTION
RETURN TO PREVIOUS MENU DMA CLOCK SELECTION QUICK MODE BUSCLK SELECTION RUN FREQ SELECTION

Select DMA CLOCK SELECTION in order to set the DMA speed. The following screen will appear.

DMA CLOCK SELECT
RETURN TO PREVIOUS WINDOW DMA → CPUX1/4 (Default) DMA → CPUX1/2

Depending on your needs, choose either DMA → CPUX 1/2 for high speed or DMA → 1/4 for low speed.

Choose the setting which you prefer. Then, return through the previous menus until you return to the main option selection menu.

Select QUICK MODE, the following screen will be offered.

QUICK MODE ENABLE/DISABLE
RETURN TO PREVIOUS WINDOW ALE → DISABLE (Default) ALE → ENABLE

Return to the main option selection menu, then choose BUSCLK SELECTION, the following screen is given.

BUS CLOCK SELECT
RETURN TO PREVIOUS WINDOW BUSCLK → PROCCLK/4 (Default) BUSCLK → PROCCLK/2

Return to the previous menu. Choose the RUN FREQ SELECTION. The following screen will appear.

RUN FREQ
RETURN TO PREVIOUS WINDOW PROCCLK → CPUX1 (Default) PROCCLK → CPUX1/2 PROCCLK → CPUX1/4 PROCCLK → CPUX1/8

Return to the previous menu. If you wish to set te wait state, you can choose WAIT STATE SETTING from the menu. The following screen will appear:

WAIT STATE SELECTION
RETURN TO PREVIOUS MENU 16-BIT DMA 8-BIT DMA LOCAL DRAM

Select 16-BIT DMA and 8-BIT DMA. They all have four selections for you to choose.

16 BIT DMA
RETURN TO PREVIOUS WINDOW 1 WAIT STATE 2 WAIT STATES 3 WAIT STATES (Default) 4 WAIT STATES

8 BIT DMA
RETURN TO PREVIOUS WINDOW 1 WAIT STATE 2 WAIT STATES 3 WAIT STATES (Default) 4 WAIT STATES

Select LOCAL DRAM, then use the up and down arrows to choose the wait state which you desire.

LOCAL DRAM
RETURN TO PREVIOUS WINDOW 0 WAIT STATES (Default) 1 WAIT STATE 1 WAIT STATE W/RAS DELAY

After this last option is set, you are ready to leave the SCAT CHIPSET SETUP PROGRAM. Return to the main menu and choose'' WRITE CMOS REGISTER AND EXIT'' and continue to setup CMOS.

Table 3.4

CMOS SETUP (C) Copyright 1985-1990, American Megatrends Inc.

Date (mn/date/year)	: Tue, Jan 01 1980
Time (hour/min/sec)	: 16:11:49
Floppy drive A	: Not Installed
Floppy drive B:	: Not Installed
Hard disk C: type	: Not Installed
Hard disk D: type	: Not Installed
Primary Display	: Monochrome
Keybpard	: Installed
BIOS shadow option	: Main BIOS
Scratch RAM option	: 1
PARITY option	: Disabled
EMS I/O ENABLE	: Disabled
EMS start address	: Disabled
RELOCATE	: Disabled

Base memory size	: 640 KB
Ext. memory size	: 1024 KB
Numeric processor	: Installed

Cylon Head WPcom LZone Sec

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

ESC = Exit, ↑↓←→ = Select, PgUp/PgDn = Modify

4.2 Explanations of Setup Parameters

The following descriptions will help you determine the correct settings for each of the basic system parameters. Table 3.4 is provided for your reference. Some screen displays may vary slightly, but should contain the same information. The values in Table 3.4 are samples only. Be sure to enter the values which are correct for your system.

System Date

Enter the system date in three steps. Enter the correct month, day, and year separately. The Setup Utility has a built-in calendar which automatically changes the day of the week as the month, date and year are changed.

System Time

As with the date, enter the system time in three steps. highlight and use the Page Up or Page Down key to set the hour, minute and second separately. Set the time as on a 24-hour clock. For example, enter 1:30 pm as 13:30:00.

Floppy Diskette Drive Type

Enter information for floppy disk drive A and B. Select the correct drive type for your drives. If no drive is present, select "Not installed".

Your system supports the following types of floppy diskette drives.

- 360KB 5 1/4″
- 1.2MB 5 1/4″
- 720KB 3 1/2″
- 1.44MB 3 1/2″

Hard Disk Drive Types

Enter the hard disk drive "type" for hard disk drives C and D. Select the correct drive type or "Not installed" if no drive is present. There are 47 different drive types. Be sure to select the correct drive type for the hard disk drive being installed.

Type	Cyln	Heads	Write Precomp	Landing Zone	Sectors	Capacity
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	31
4	940	8	512	940	17	62
5	940	6	512	940	17	47
6	615	4	None	615	17	20
7	462	8	256	511	17	31
8	733	5	None	733	17	30
9	900	15	None	901	17	112
10	820	3	None	820	17	20
11	855	5	None	855	17	35
12	855	7	None	855	17	50
13	306	8	128	319	17	20
14	733	7	None	733	17	43
15	RESERVED					
16	612	4	All	663	17	20
17	997	5	300	977	17	41
18	977	7	None	997	17	57
19	1024	7	512	1023	17	60
20	733	5	300	732	17	30
21	733	7	300	732	17	43
22	733	5	300	733	17	30
23	306	4	All	336	17	10
24	925	7	All	925	17	54
25	925	9	None	925	17	69
26	754	7	754	754	17	44
27	754	11	None	754	17	69
28	699	7	256	699	17	41
29	823	10	None	823	17	68
30	918	7	918	918	17	53
31	1024	11	None	1024	17	94
32	1024	15	None	1024	17	127
33	1024	5	1024	1024	17	43
34	612	2	128	612	17	10
35	1024	9	None	1024	17	77

Type	Cyln	Heads	Write Precomp	Landing Zone	Sectors	Capacity
36	1024	8	512	1024	17	68
37	615	8	128	615	17	41
38	987	3	987	987	17	25
39	987	7	987	987	17	57
40	820	6	820	820	17	41
41	977	5	977	977	17	41
42	981	5	981	981	17	41
43	830	7	512	830	17	48
44	830	10	None	830	17	69
45	917	15	None	918	17	114
46	1224	15	None	1223	17	152
47	user defined*					

* If you are using a hard disk drive which does not mathch any of the drive types 1-46, you may enter your drive parameters under type 47. Contact your hard disk drive manufacturer for the proper parameter values.

Primary Display

The Setup configuration must be set for the type of video display adapter that is being used for your display monitor. Your system supports the following types.

- Monochrome
- Color 80 x 25
- VGA or EGA
- Color 40 x 25
- Not Installed

This setting must also match the jumper configuration on the main board.

Scratch RAM option

The following option messages will be displayed:

If required, BIOS will use 256bytes of RAM

1. Using BIOS stack area 0030:0000
2. Reducing base memory size by 1KB

Choose option 1 or 2 depending on your needs.

BIOS Shadow option

Options:
Main or video BIOS shadow Enable/Disable

PARITY Option: Disabled

Options:
Enabled: PARITY Enable
Disabled: PARITY Disable

EMS I/O ENABLE: Disabled

Options:
Enabled: EMS I/O access enabled
Disabled: EMS I/O access diabled

EMS start address: Disabled

Options:
Disable EMS
Enable EMS above 1m, 1.25m, 1.5m, 2m, 3m

RELOCATE: Disabled

Options:
Enabled: 384KB relocated, shodow not possible
Disabled: 384KB relocated, shodow possible

Choose disable or enable dependingon your needs.

If you want to use EMS 4.0 function, please refer to table 3.5.

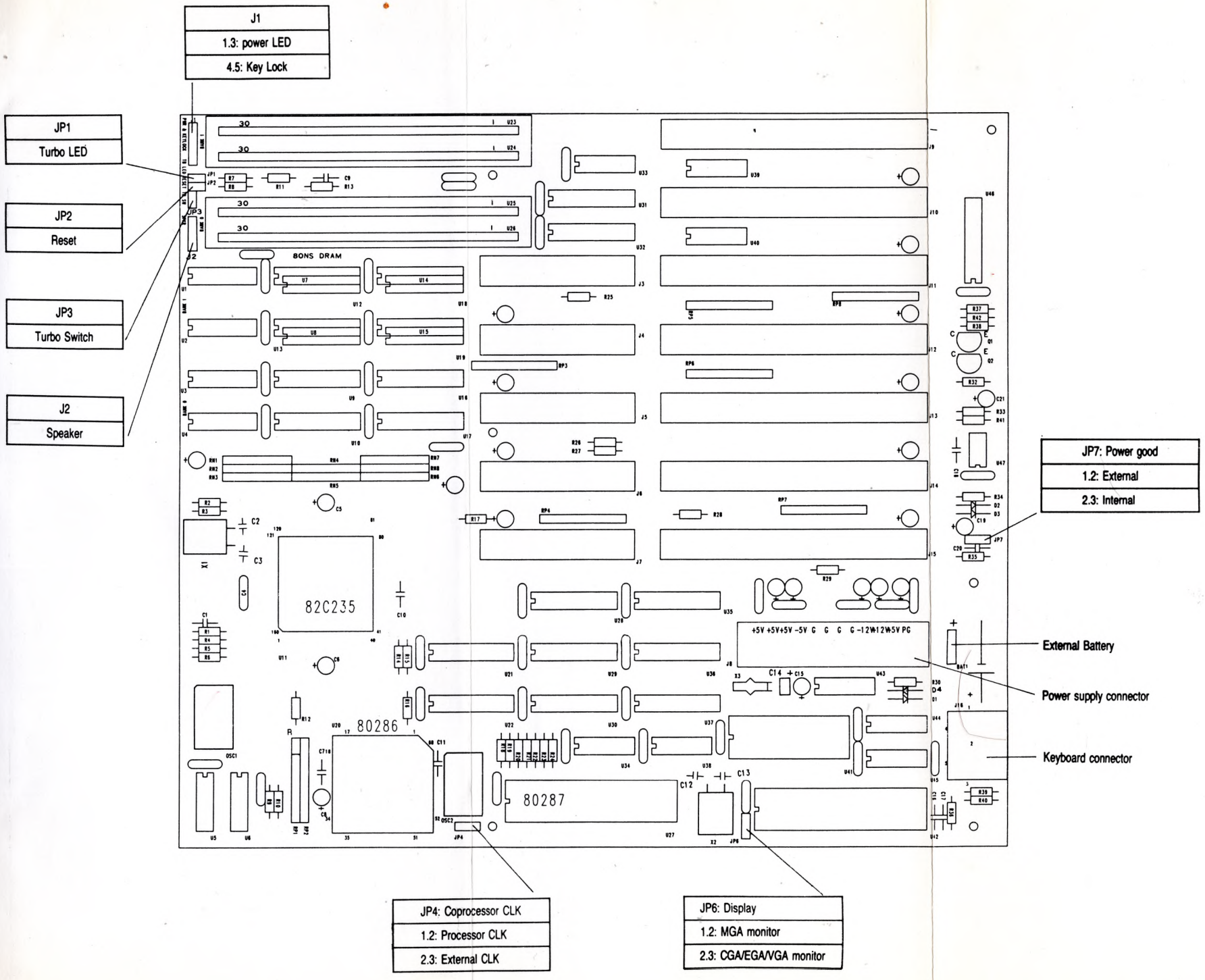
EMS Setup

Enter to CMOS when AMI BIOS Setup Utility is activated.

Table 3.5

On Board Memory	1M	2M	4M
BIOS Shadow Option	Disabled	Enabled	Enabled
EMS I/O enable	Enabled	Enabled	Enabled
EMS start address	1M	1M or 1.25M or 1.5M	1M or 1.25M or 1.5M or 2M or 3M
Relocate	Enabled	Disabled	Disabled

NOTE: When your system memory size is IMB, you only choose either BIOS shadow or EMS. If you choose EMS, the defaults of EMS and Relocate must be the same.



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